Curved Mirrors Lab /45 (I)

**Materials:** concave mirror/convex mirror, ray box with filter.

**Note:**

* In all your diagrams, always include arrow heads on your light rays to indicate what direction the light is traveling.
* Use the observation sheet provided for every activity.
* Make sure all your work is neat and labelled (e.g. use a ruler to draw lines).

**Activity 1 – Finding the Focal Point for Concave Mirrors (8 marks)**

Using a concave mirror and a ray box with filter:

1. Put your concave mirror on the Activity 1 sheet and shine the ray box with three slits so that the middle slit runs along the principle axis. Adjust the set up so the reflected rays meet on the principal axis.
2. Find and label the focal point and trace your mirror. (1 mark)
3. Trace the path of the three incident and reflected rays. This is best done by putting 2 dots along each incident ray, removing all your equipment and using a ruler to draw the path of the rays. (3 marks)
4. Determine the location of the centre of curvature and label it. (1 mark)
5. Label the principal axis and vertex. (1 mark)
6. Draw the normal lines for the three incident and reflected rays. (1 mark)
7. Make sure everything is labelled and your diagram looks neat. (1 mark)

**Activity 2 – Predict and Test Rays for Concave Mirrors (16 marks)**

Using the concave mirror and the ray box with filter:

1. Working on the sheet for Activity 2, find and label the focal point, the centre of curvature, vertex, and principal axis. Trace your mirror but do not trace any rays yet. (3 marks)
2. Shine a single ray of light toward the mirror that is parallel to the principal axis. Trace the path of the incident ray and reflected ray. Trace where you expect the **normal** to be. (3 marks)

*How does this incident ray reflect off the mirror?* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Shine a single ray of light towards the concave mirror that passes through the focal point. Trace the path of the incident ray and reflected ray. Trace where you expect the **normal** to be. (3 marks)

How does this incident ray reflect off the mirror? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Shine a single ray of light towards the concave mirror that is pointing toward an angle at the vertex. Trace the path of the incident ray and reflected ray. Trace where you expect the **normal** to be. (3 marks)

How does this ray reflect off the mirror?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Shine a single ray of light towards the concave mirror that is going through the centre of curvature. Trace the path of the incident ray and reflected ray. Trace where you expect the **normal** to be. (3 marks)

How does this ray reflect off the mirror?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Make sure your diagram looks neat. You may use different colour lines for each of your rays. (1 mark)

**Activity 3 – Finding the Focal Point for Convex Mirrors (8 marks)**

Using a convex mirror and ray box with filter:

1. Put your convex mirror on the Activity 3 sheet and shine the ray box with three slits so that the middle slit runs along the principle axis. Adjust the set up so the reflected rays meet on the principal axis.
2. Trace the path of the three incident and reflected rays. (3 marks)
3. Find and label the focal point and trace your mirror. (1 mark)
4. Determine the location of the centre of curvature and label it. (1 mark)
5. Label the principal axis and vertex. (1 mark)
6. Draw the normal lines for the three incident and reflected rays. (1 mark)
7. Make sure everything is labelled and your diagram looks neat. (1 mark)

**Activity 4 – Predict and Test Rays for Convex Mirrors (13 marks)**

Using the convex mirror and the ray box with filter:

1. Working on the sheet for Activity 4, find and label the focal point, the centre of curvature, vertex, and principal axis. Trace your mirror but do not trace any rays yet. (3 marks)
2. Shine a single ray of light toward the mirror that is parallel to the principal axis. Trace the path of the incident ray and reflected ray. Trace where you expect the **normal** to be. (3 marks)

*How does this incident ray reflect off the mirror?* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Shine a single ray of light towards the mirror that is aimed at the focal point. Trace the path of the incident ray and reflected ray. Trace where you expect the **normal** to be. (3 marks)

How does this incident ray reflect off the mirror? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Shine a single ray of light towards the mirror that is aimed at the centre of curvature. Trace the path of the incident ray and reflected ray. Trace where you expect the **normal** to be. (3 marks)

How does this ray reflect off the mirror?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Make sure your diagram looks neat. You may use different colour lines for each of your rays. (1 mark)

**\*\*\*PUT ALL THE EQUIPMENT AWAY NEATLY\*\*\***

**/8**



**Activity 1**

Put your curved mirror near here and trace it

**/16**



**Activity 2**

Put your curved mirror near here and trace it

**Activity 3**

Put your curved mirror near here and trace it



**/8**

**/13**

**Activity 4**

Put your curved mirror near here and trace it

